Perspective
Volume 09: 01, 2025

Virology: Current Research

ISSN: 2736-657X

Open Access

Progress in *In Vitro* Cultivation of Human Norovirus in the Past Two Decades

Rhiona Cai*

Department of Medical Microbiology, Marmara University, Istanbul 3484, Türkiye

Introduction

Human Norovirus (HuNoV) is a leading cause of viral gastroenteritis worldwide, resulting in widespread outbreaks in various settings such as hospitals, schools, cruise ships, and restaurants. Characterized by its ability to cause symptoms such as vomiting, diarrhea, and abdominal cramps, Norovirus is highly contagious and poses significant public health concerns. Despite its widespread impact, the study and understanding of this virus have faced substantial challenges due to the inability to reliably culture it in laboratory settings for many years. However, over the last two decades, significant advancements in in vitro culturing techniques have opened up new avenues for research and vaccine development. This article discusses the progress made in the culturing of human Norovirus over the past 20 years, the methods involved, and the implications of these developments for understanding the virus and combating its effects [1,2].

Description

Human Norovirus, a member of the Caliciviridae family, is notoriously difficult to study because it does not easily propagate in conventional laboratory cell lines. For many years, the absence of a reliable in vitro culture system hindered the study of its biology, pathogenesis, and potential treatments. Researchers faced significant barriers, as Norovirus could not be easily cultured in widely used cell lines like Vero or HeLa cells. The virus also exhibits a preference for infecting human intestinal cells, adding another layer of complexity to *in vitro* studies. The lack of a reliable culture system meant that much of the early research on Norovirus relied on animal models, primarily non-human primates, or clinical studies based on patient samples. While these models provided some insights, they were not ideal for large-scale studies, and they did not allow for the kind of detailed molecular analysis that a cell culture system could offer.

One of the most significant advancements in the past two decades has been the development of human intestinal organoid cultures. These organoids, which are three-dimensional structures that mimic the architecture and functionality of the human intestine, have proven to be a game-changer for Norovirus research. The first successful cultivation of human Norovirus in these organoid systems was reported in 2015. This development came after years of trial and error with various cell lines and culture systems. Human intestinal organoids are derived from stem cells and can be expanded in the laboratory while maintaining the functional characteristics of the human gut. These organoids contain a variety of cell types, including enterocytes (intestinal cells), goblet cells, and enteroendocrine cells, which are critical for viral infection. This breakthrough was a major milestone in Norovirus research and provided a platform for a deeper understanding of its biology, pathogenesis, and interactions with host cells [3-5].

Conclusion

The advancements in the in vitro culturing of human Norovirus over the past 20 years have revolutionized the field of viral gastroenteritis research. From the development of human intestinal organoid systems to the use of advanced molecular techniques and high-throughput screening, these innovations have provided researchers with unprecedented tools to study Norovirus and its impact on human health. These advancements have not only improved our understanding of the virus's biology but have also accelerated the development of potential vaccines and antiviral therapies. As research continues, the insights gained from these in vitro culturing systems hold the promise of better preventing and treating Norovirus infections, which will have significant public health benefits worldwide.

Acknowledgement

None.

Conflict of Interest

None.

References

1. Burns, Jane C., Howard I. Kushner, John F. Bastian and Hiroko Shike, et al. "Kawasaki disease: A brief history." *Pediatrics* 106 (2000): 27-27.
2. Hendriks, Gillian and Suresh Chandran. "Kawasaki Disease: Management Challenges during COVID-19 Pandemic with an Upsurge in Multisystem Inflammatory Syndrome in Children." *Rheumato* 2 (2022): 34-45.
3. Agarwal, Shreya and Devendra K. Agrawal. "Kawasaki disease: Etiopathogenesis and novel treatment strategies." *Expert Rev Clin Immunol* 13 (2017): 247-258.
4. Matsukura, Hiro, Serina Majima and Tomoko Sakuma. "Concurrent Coxsackie Virus A6 Infection and Kawasaki Disease." *Indian Pediatr* 59 (2022): 656.
5. Shimizu, Daisuke, Takayuki Hoshina, Masaru Kawamura and Yoshie Tomita, et al. "The possible association between epidemics of hand-foot-and-mouth disease and responsiveness to immunoglobulin therapy in Kawasaki disease." *Front Pediatr* 10 (2022): 968-857.

***Address for Correspondence:** Rhiona Cai, Department of Medical Microbiology, Marmara University, Istanbul 3484, Türkiye, E-mail: cair@gmail.com*

Received: 02 January, 2025, Manuscript No. vcrh-25-163572; **Editor assigned**: 04 January, 2025, Pre QC No. P-163572; **Reviewed:** 16 January, 2025, QC No. Q-163572; **Revised:** 23 January, 2025, Manuscript No. R-163572; **Published:** 30 January, 2025, DOI: 10.37421/2736-657X.2025.9.289

How to cite this article: Cai, Rhiona. "Progress in *In Vitro* Cultivation of Human Norovirus in the Past Two Decades." Virol Curr Res 9 (2025): 289.